

***Acteonina permiana*, a new species from the Permian Coyote Butte Formation, central Oregon (Mollusca: Gastropoda: Actaeonidae)**

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Abstract.—*Acteonina permiana*, is described from the Early Permian Coyote Butte Formation of Crook County, central Oregon. Occurrence of *Acteonina* indicates affinity with the Carboniferous to Permian Boreal faunal province, and implies that the Grindstone terrane need not have an “exotic” origin thousands of kilometers from the North American continent during the Permian.

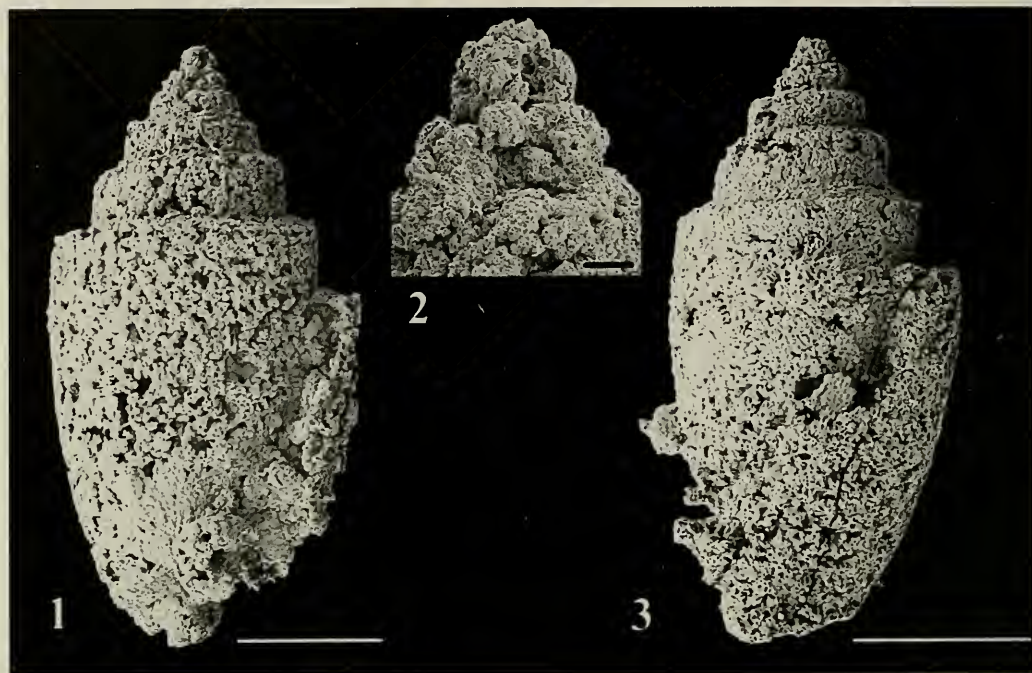
Acteonina is among the rarest of all Upper Paleozoic gastropod genera. Knight (1932, 1936, 1941) counted only two known specimens, both from the Visean of Belgium. In their survey of Paleozoic opisthobranch gastropods, Kollmann & Yochelson (1976) point out that the genus, *Acteonina*, “. . . has not yet been found in North America in spite of careful search among large collections of Pennsylvanian and Permian gastropods.” Acid etching of limestone samples from the Early Permian (Wolfcampian-Leonardina) Coyote Butte Formation of central Oregon has produced many new taxa (Hengstenberg et al. 1997), including four specimens of the new species, *Acteonina permiana*.

The presence of *Acteonina* in Oregon has important implications for western North American terrane paleogeography. The Coyote Butte Formation is part of the Upper Paleozoic–Mesozoic Grindstone terrane of central Oregon (Wardlaw et al. 1982), and occurs as chaotically intermixed limestone blocks within cherts and volcanoclastics. The limestone is interpreted as slide and slump blocks that became detached from a carbonate shelf and incorporated into deeper-water basinal clastics

in a forearc basin (Blome & Nestell 1991). The exact dimensions of this basin, and specifically the longitudinal separation of this island arc from the North American mainland remain controversial, and distances of greater than 5000 km with southern hemisphere origins have been hypothesized (Jones 1990, Miller et al. 1992).

The Coyote Butte Formation fauna has been only partially described: brachiopods (Cooper 1957); fusulinids (Skinner & Wilde 1966), colonial rugose corals (Stevens & Rycerski 1983) and conodonts (Wardlaw et al. 1982). Acid etching reveals the presence of many undescribed gastropods, bivalves, chitons, rostroconchs, nautiloids, bryozoans, sponges, trilobites, ostracods and annelids. A detailed paleobiogeography, incorporating the paleoecological framework, is desirable, but much basic taxonomic work needs to be completed on these important taxa.

Of the described fauna, the fusulinids and corals have thus far been most useful for paleobiogeographic comparison. The colonial rugose corals are part of a “*Thysanophyllum* Belt” fauna that existed along the northern and western margins of Pangea, but Stevens and Rycerski (1983) suggested



Figs. 1–3. *Acteonina permiana*, new species, from the Coyote Butte Limestone, Crook County, Oregon. 1, Holotype USNM 498736. Bar is 1 mm; 2, Holotype USNM 498736, close-up of protoconch, showing heterostrophic larval whorl. Bar is 100 μ m; 3, Paratype USNM 498737. Bar is 1 mm.

that the Coyote Butte fauna might have existed several hundred kilometers west of the margin based upon high Otsuka coefficient similarity with known exotic terranes. Fusulinids suggest a position at equatorial latitudes and many hundreds of kilometers west of the Permian North American margin (Ross and Ross 1983).

Presence of the only other species, *A. carbonaria*, in the plate-bound basins of Belgium suggests a northern hemisphere position for the Coyote Butte Formation and general affinity with the Carboniferous–Permian Boreal fauna. Biogeographic evidence from so small a sample size is tenuous, but corroborates preliminary paleomagnetic evidence (Harbert et al. 1995) of a northern hemisphere position for the Oregon Blue Mountains region. Long distance transport of the Grindstone terrane is not required for this distribution.

Systematic Paleontology

Family Actaeonidae d'Orbigny, 1842

Genus *Acteonina* d'Orbigny, 1850
type species *Acteonina carbonaria*
(DeKoninck, 1843)

Acteonina permiana, new species
Figs. 1–3

Diagnosis.—Very small (less than 4 mm length), shell outline like modern genus, *Conus*, with turret-stepped spire, elongate aperture, heterostrophic larval shell and columella with plica.

Description.—Small for genus; subcylindrical outline, superficially resembling *Conus*; flat whorl profile and rectangular sutures, producing a turreted spire; broad sutural ramp; narrow aperture, shallowly expanded at base; concave, plicate columella; heterostrophic larval whorl (Fig. 2).

Depository.—Four silicified specimens

are housed in the collections of the Department of Paleobiology, National Museum of Natural History (USNM), Smithsonian Institution, Washington, D.C. Type specimens include: USNM 498736 (holotype), USNM 498737 (paratype). The two other specimens (USNM 498738, USNM 498739) are fragments of turreted spires that also have the sutural ramp and five whorls.

Measurements.—USNM 498736 (holotype, Figs. 1, 2): length—4.10 mm, width—3.61 mm, whorl number—6. USNM 498737 (paratype, Fig. 3): length—2.15 mm, width—1.66 mm, whorl number—5.5.

Discussion.—The other species of the genus, *A. carbonaria*, is about two times the length of *A. permiana*. Whorl counts are the same for both species so we are not comparing juveniles of the Permian with adults of the Carboniferous. The acid etched residues from the Coyote Butte Fm. contain species from many different phyla that have variable lengths from several mm to several cm, so we are not biased by a size-sorted sample. *Acteonina carbonaria* also has a prominent collar-like ridge at the base of the parietal wall, which is absent or not preserved in *A. permiana*.

Location.—The fossil locality is in Crook County, Oregon, which may be found on the Twelvemile Reservoir, Oregon 7.5 minute U.S. Geological Survey quadrangle, 1981 edition. The UTM coordinate is 11TKU75826907. The geographic coordinates are 119°47'17"N, 97°44'10"W.

Age.—Early Permian (Wolfcampian to Leonardian) ages for the Coyote Butte Formation are suggested by: brachiopods (Cooper 1957), conodonts (Wardlaw et al. 1982), colonial rugose corals (Stevens & Rycerski 1983) and fusulinids (Skinner & Wilde 1966).

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